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RESPONSE UNDER 37 C.F.R. § 1.192
APPELLANT'S BRIEF
PATENT APPLICATION
SERIAL NO. 09/685,297
ATTY. DOCKET NO. 3487-001146

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Group Art Unit 1743 :
In re application of :
ROBERT B. CODY :
Serial No. 09/685,297 :
Filed October 10, 2000 :
Examiner: Brian R. Gordon :

CHEMICAL ANALYSIS METHOD
FOR MULTIPLEXED SAMPLES

Pittsburgh, Pennsylvania
January 6, 2003

APPEAL BRIEF

BOX AF
Commissioner for Patents
Washington, D.C. 20231

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal mailed on November 6, 2002 and received by the Patent Office on November 13, 2002. The Notice of Appeal appeals the final rejection of claims 1-9.

The headings used hereinafter and the subject matter set forth under each heading are in accordance with 37 C.F.R. § 1.192(c).

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, Washington, D.C. 20231 on January 6, 2003.

Lori A. Fratangelo

(Name of Person Making Deposit)

Lori A. Fratangelo
Signature

1/6/2003
Date

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I

REAL PARTY IN INTEREST

JEOL USA, Inc. is the Assignee of the entire right, title, and interest to the above-identified application and, as such, is the real party in interest in this Appeal.

II

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee of the above-identified application which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending Appeal.

III

STATUS OF CLAIMS

Claims 1-4 and 9 are finally rejected under 35 U.S.C. § 103 as being directed to subject matter which would have been obvious to one of ordinary skill in the art at the time the invention was made from the teachings of U.S. Patent No. 5,508,204 to Norman (hereinafter "Norman");

Claims 4 and 5 are finally rejected under 35 U.S.C. § 103 as being directed to subject matter which would have been obvious to one of ordinary skill in the art at the time the invention was made from the teachings of Norman in view of U.S. Patent No. 4,978,852 to Williams et al. (hereinafter "Williams"); and

Claims 6-8 are finally rejected under 35 U.S.C. § 103 as being directed to subject matter which would have been obvious to one of ordinary skill in the art at the time the invention was made from the combined teachings of Norman in view of U.S. Patent No. 6,066,848 to Kassel et al. (hereinafter "Kassel").

Claims 1-9 are reproduced in Appendix A which is attached hereto.

IV

STATUS OF AMENDMENTS

A Response after final rejection was submitted in this application on September 17, 2002 arguing for the allowability of the claims but making no claim amendments. There were no claim changes made after the Final Office Action dated July 18, 2002 or after the first Office Action of the merits dated January 15, 2002. The claims on appeal are the claims as originally filed on October 10, 2000, which are finally rejected in the Final Office Action of July 18, 2002.

V

SUMMARY OF THE INVENTION

The claims on appeal are directed toward a method for analyzing a plurality of fluid specimens with a single analyzing instrument. The method includes the steps of:

- a) preparing a plurality of N fluid specimens;
- b) introducing a first combination of r specimens wherein r is less than N into a homogenizing volume to create a homogenized specimen;
- c) introducing at least a portion of the homogenized specimen to the analyzing instrument and recording the results of the analysis maintaining an association with the combination of r specimens;
- d) introducing additional different combinations of specimens into said homogenizing volume and repeating steps b) and c); and
- e) with a programmed digital computer mathematically processing the recorded results to produce analyses corresponding to individual fluid specimens.

As discussed in the present specification at pages 1 and 2, a problem with conventional analysis methods of fluid specimens is a poor signal-to-noise ratio for a given time period. In order to deal with this problem, specimens are conventionally measured one

at a time, multiple times, in order to gain an acceptable signal-to-noise ratio. Thus, an extremely long period of time for analysis is required in order to have an acceptable signal-to-noise ratio. In Appellant's invention, this problem is overcome by providing a plurality of fluid samples simultaneously and analyzing them using a multiplexed sampling method that includes a mathematical transform technique to improve the signal-to-noise ratio for a given time period or to shorten the time period for a given signal-to-noise ratio.

VI

ISSUES PRESENTED

The following issues are presented in this Appeal:

- a) Whether claims 1-3 and 9 are directed toward obvious subject matter in light of Norman,
- b) Whether claims 4 and 5 are directed toward obvious subject matter in light of Norman taken in view of Williams, and
- c) Whether claims 6-8 are directed toward obvious subject matter in light of Norman taken in view of Kassel.

VII

GROUPING OF CLAIMS

Claims 1-9 do not stand or fall together but can be grouped according to the following:

- a) Claims 1 and 2 stand or fall together;
- b) Claims 3 and 9 stand or fall together;
- c) Claims 4 and 5 stand or fall together; and
- d) Claims 6-8 stand or fall together.

The support for the independent consideration of each grouping of claims is addressed in the arguments set forth in the Argument section of this Appeal Brief and also for the following reasons:

Dependent claims 3 and 9 depend from claim 1, but the Examiner advances specific arguments with respect to these claims different from those for claims 1 and 2 (Final Office Action at section 5). Claims 4 and 5 depend from claim 1, but the Examiner advances specific arguments with respect to claims 4 and 5 (Final Office Action at section 6). Claims 6-8 depend from claim 1, but the Examiner advances specific arguments with respect to these claims (Final Office Action at section 7).

VIII

ARGUMENT

Each issue presented for review is addressed hereinafter under the appropriate heading:

Whether Claims 1-3 and 9 Are Directed Toward Obvious Subject Matter in Light of Norman

Claim 1 is directed to a method for analyzing a plurality of fluid specimens with a single analyzing instrument including the steps of:

- a) preparing a plurality of N fluid specimens;
- b) introducing a first combination of r specimens wherein r is less than N into a homogenizing volume to create a homogenized specimen;
- c) introducing at least a portion of the homogenized specimen to the analyzing instrument and recording the results of the analysis maintaining an association with the combination of r specimens;
- d) introducing additional different combinations of specimens into said homogenizing volume and repeating steps b) and c); and

e) with a programmed digital computer mathematically processing the recorded results to produce analyses corresponding to individual fluid specimens.

Norman discloses a method for analyzing multiple analyte specimens whereby a first analyte specimen is introduced into an analytical column and is allowed to partially travel into the column after which a second analyte specimen is introduced into the analytical column. The analytical column is heated such that the first and second analyte specimens concurrently and discretely travel through, and sequentially elute from, the analytical column. (Column 3, lines 24-55.)

Nothing in the Norman patent suggests the introduction of homogenized specimens. Indeed, the clear import of the Norman patent is that the specimens are not mixed or homogenized. A requirement of claim 1 is that the specimens are homogenized. It is illogical to assert, as the Examiner has, that a reference teaches the very opposite of what it actually teaches. While noting that the Norman patent does not "specifically recite" that specimens are homogenized, the Examiner sets forth no reason why it would have been obvious from the disclosure of Norman to do so. Norman not only does not specifically recite that the specimens are homogenized, Norman does not imply that they are homogenized. Indeed, Norman specifically teaches that the specimens are not homogenized but "discretely travel through" the analytical column. (Column 3, lines 53-55.)

In order to bolster his argument, the Examiner indicates in section 5 of the Advisory Action dated October 8, 2002, that:

Claim 1 recites the steps of "(a) preparing a plurality of N fluid specimens; (b) introducing a first combination of r specimens wherein r is less than N in to a homogenizing volume to create a homogenized specimen." In the instance that N is 2, then r could be 1 as such the disclosure of Norman would and does meet the limitation of the claim.

This is a clear misreading of the plain language of claim 1. It is well established that dictionaries are particularly useful resources to assist in determining the

ordinary and customary meanings of claim terms. Teleflex, Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1325, 63 U.S.P.Q.2d 1374, 1380 (Fed. Cir. 2002). Dictionaries are always available to the court to aid in the task of determining meanings that would have been attributed by those of skill in the relevant art to any disputed terms used by the inventor in the claims. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1584 n.3, 39 U.S.P.Q.2d 1573, 1578 n.3 (Fed. Cir. 1996)

Claim 1 recites that a first combination of r specimens is introduced into a homogenizing volume. Webster's Third New International Dictionary (1986) defines a combination as "a union or aggregate made by combining one thing with another." Applying this definition to claim 1, r must be at least 2, otherwise one thing would not be combined with another. Further, each of the 2 "r" specimens must be different, otherwise the "another" part of the definition would not be satisfied. Therefore, the plain meaning of the words in claim 1 requires that r be at least 2 different specimens and, therefore, N must be at least 3 specimens. As claim 1 is not obvious over Norman, the rejection under 35 U.S.C. § 103(a) cannot stand.

Claim 2 depends from claim 1 and requires that the fluid specimens are gaseous specimens diluted with a carrier gas. Further to the discussion above, it does not matter what physical form the specimens are in. Claims 1 and 2 require that a combination of r specimens be homogenized and then introduced to an analyzing instrument. Norman requires that each specimen discretely travel through an analyzing instrument. Because Norman does not disclose, suggest, teach or in any way motivate one skilled in the art to homogenize specimens as in claim 2, claim 2 is not obvious over Norman.

Regarding claims 3 and 9, the Examiner indicates that it would have been obvious to one skilled in the art to employ a carrier gas. Claim 3 depends from claim 1 and requires that the analyzing instrument be a mass spectrometer. Claim 3 requires specimen

homogenization as discussed above, which is not disclosed, suggested or in any way taught by Norman, regardless of the type of analytical instrument used. Therefore, claim 3 is not obvious over Norman.

Claim 9 specifically recites that N is an odd number greater than 2 and r is an even number equal to $(N+1)/2$ (i.e., r must be at least 2). Claim 9 specifically recites what the Examiner asserted the claims were lacking in the Advisory Action dated October 8, 2002. The Examiner stated that if N is 2, then r could be 1 and that in that instance, the disclosure of Norman would meet the limitation of the claim. But claim 9 requires that the Examiner's requirement for meeting the disclosure of Norman can never be met. Thus, claim 9 is not obvious over Norman.

Whether Claims 4 and 5 are Directed Toward Obvious
Subject Matter in Light of Norman Taken in View of Williams

The Examiner suggests that claims 4 and 5 are obvious over Norman in view of Williams. Claim 4 depends from claim 1 and requires that the mathematical processing include deconvolution. Claim 5 depends from claim 4 and requires that the mathematical processing include a Hadamard transform.

Williams discloses a method for simultaneous collection of multiple spectra using tandem and multidimensional mass spectrometry from multiple precursors where yields have correspondingly enhanced sensitivity through the use of Hadamard transform deconvolution. In the method, MS spectra are coded by a Hadamard differences method wherein the combined daughter spectrum of a selected half of a precursor is subtracted from the combined daughter spectrum of the remaining precursors, so that no ions are lost.

Claim 4 depends from claim 1 and requires specimen homogenization as discussed above. Williams does not disclose, teach or in any way motivate one skilled in the art to homogenize samples as in the present claims. Claims 4 and 5 require specimen homogenization as discussed above, which is not disclosed, suggested or in any way taught

by Williams, or, as discussed above, by Norman. Regardless of the type of mathematical processing method employed, the combination of Williams and Norman does not teach the homogenization step in the claimed method. Therefore, claims 4 and 5 are not obvious over the combination of Williams and Norman.

Whether Claims 6-8 Are Directed Toward Obvious
Subject Matter in Light of Norman Taken in View of Kassel

The Examiner suggests that claims 6-8 are obvious over Norman in view of Kassel. Claim 6 depends from claim 1 and requires that each specimen be directed into the homogenizing volume from individual nozzles connected to electronically controlled valves. Claim 7 depends from claim 6 and requires that the nozzle sizes, pressure drops therethrough, and open times of the valves are controlled to introduce a specified mass of each fluid specimen into the homogenizing volume. Claim 8 depends from claim 7 and requires that when the nozzles are not supplying specimen to the homogenizing volume, the flow of the specimen is diverted and continued.

Kassel discloses a method of analyzing each of a plurality of fluid samples by simultaneously spraying a plurality of fluid samples from an electrospray needle array toward a mass spectrometer and positioning a blocking device to block all but one of the fluid samples from reaching the mass spectrometer. The electrospray needle array and blocking device are moved relative to one another to permit at least two of the plurality of fluid samples to reach the mass spectrometer one at a time. The fluid samples are analyzed sequentially as they reach the mass spectrometer.

Claim 6 depends from claim 1 and requires specimen homogenization as discussed above. The method according to Kassel specifically requires that the fluid samples are analyzed sequentially, one at a time. Kassel does not disclose, teach or in any way motivate one skilled in the art to homogenize samples as in the present claims. Claims 6-8 require specimen homogenization as discussed above, which is not disclosed, suggested or in

any way taught by Kassel or, as discussed above, by Norman. Regardless of the type of nozzles or valves employed, the combination of Kassel and Norman does not teach the homogenization step in the claimed method. Therefore, claims 6-8 are not obvious over the combination of Kassel and Norman.

IX

SUMMARY

When making rejections under 35 U.S.C. § 103, the Examiner has the burden of establishing a *prima facie* showing of obviousness. In re Fritch, 972 F.2d 1260, 1265, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). To establish a *prima facie* case, the Examiner must satisfy three requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. See In re Fine, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); In re Skinner, 2 U.S.P.Q.2d 1788, 1790 (Bd. Pat. App. & Int. 1986). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. See Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 927 F.2d 1200, 1208, 18 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1991). Hindsight is not a justifiable basis on which to find that ultimate achievement of a goal was obvious. Id. Lastly, the prior art reference or combination of references must teach or suggest all the limitations of the claims. See In re Wilson, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Moreover, the teachings or suggestions, as well as the expectation of success, must come from the prior art, not Appellant's disclosure. See In re Vaeck, 947 F.2d 488, 492, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). Also, the mere fact that the prior art could be modified would not have made the modification obvious unless the prior art suggested the

desirability of the modification. In re Laskowski, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1399 (Fed. Cir. 1989) (quoting In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984)).

In the instant case, the Examiner opines that even though Norman does not specifically recite that the specimens are homogenized or that the analysis steps are repeated for each combination of specimens, it would have been obvious for one skilled in the art to recognize that the analysis steps would be repeated for each combination of samples in order to compare and obtain accurate measurements of the specimens. The Examiner further asserts that it would have been obvious to use deconvolution to enhance sensitivity and to use valves in order to control the admittance of specimens. However, the Examiner never indicates any basis for holding, or disclosure in the cited prior art that would suggest, teach or motivate one skilled in the art to homogenize two or more fluid specimens prior to analysis by an analytical instrument.

The present invention addresses the problem of poor signal-to-noise ratio for a given time period with conventional analysis methods of fluid specimens. Appellant has overcome the problem by providing a plurality of fluid samples simultaneously and analyzing them using a multiplexed sampling method whereby two or more specimens are homogenized, provided to an analytical instrument, and analyzed using a method that includes a mathematical transform technique. The step requiring homogenization of two or more fluid specimens is a key step in reducing the signal-to-noise ratio for a given period of time and is not disclosed or in any way suggested by any combination of the cited prior art.

X

CONCLUSION

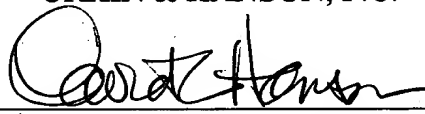
The claims define a unique method for analyzing a plurality of fluid specimens with a single analyzing instrument. The Examiner has not addressed all of the

limitations of the independent claims or the corresponding dependent claims. In order to establish a *prima facie* case, the Examiner must show that each limitation is met or made obvious by the applied prior art and the Examiner has failed to do so. The preponderance of evidence clearly establishes the allowability of claims 1-9. Reversal of all of the Examiner's rejections and allowance of these claims are respectfully requested.

A check in the amount of \$320.00 accompanies this Appeal Brief. The Commissioner for Patents is hereby authorized to charge any additional fees which may be required to Deposit Account No. 23-0650. Please refund any overpayments to Deposit Account No. 23-0650. An original and two copies of this Appeal Brief are enclosed.

Respectfully submitted,

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APPENDIX A

PENDING CLAIMS

1. A method for analyzing a plurality of fluid specimens with a single analyzing instrument comprising the steps for:

- a) preparing a plurality of N fluid specimens;
- b) introducing a first combination of r specimens wherein r is less than N into a homogenizing volume to create a homogenized specimen;
- c) introducing at least a portion of the homogenized specimen to the analyzing instrument and recording the results of the analysis maintaining an association with the combination of r specimens;
- d) introducing additional different combinations of specimens into said homogenizing volume and repeating steps b) and c); and
- e) with a programmed digital computer mathematically processing the recorded results to produce analyses corresponding to individual fluid specimens.

2. The method according to claim 1, wherein the fluid specimens are gaseous specimens diluted with a carrier gas.

3. The method according to claim 2, wherein the analyzing instrument is a mass spectrometer.

4. The method according to claim 3, wherein the mathematical processing comprises deconvolution.

5. The method according to claim 4, wherein the mathematical processing comprises a Hadamard transform.

6. The method according to claim 1, wherein each specimen is directed into the homogenizing volume from individual nozzles connected to electronically controlled valves.

7. The method according to claim 6, wherein the nozzle sizes, pressure drops therethrough, and open times of said valves is controlled to introduce a specified mass of each fluid specimen into the homogenizing volume.

8. The method according to claim 7, wherein when the nozzles are not supplying specimen to the homogenizing volume the flow of the specimen is diverted and continued.

9. The method according to claim 1, wherein N is an odd number greater than 2 and r is an even number equal to $(N+1)/2$.